

even though there may be only a few here who had the good fortune to know him while he was alive.

It was as an inventor that Edison achieved his great popular acclaim, but great inventor as he was, he was much more than that. He was a versatile engineer who saw all sides of an engineering problem. To him the incandescent lamp with its brilliantly conceived carbon filament was part of a system of illumination embodying a primary power source, means for efficient distribution of power, meters for measuring it, provisions for safety, and the multitude of components needed to make up the first electric illumination system for interior lighting. All of these had to be devised, developed, and built to achieve the ends he sought; so it was with many other projects that he created. Thus Edison was, among other things, a systems engineer. Indeed, he was in himself a complete research and development department. With all of his curiosity and enthusiasm, he kept his feet on the ground and had a sharp eye on the economic aspects of his undertakings.

Not all of his projects proved to be profitable but they were all well-considered investments of his money, time, and effort to uncover and apply new knowledge with useful and profitable ends in view. His methods in research were peculiarly his own and were very different from those of academic scientists, many of whom looked askance at his cut-and-try procedures. He was, it is true, an empiricist but a very intelligent one, well informed in theory but willing to try experiments just to see what would happen and without too much regard to their doing violence to accepted theoretical patterns. Intelligent empiricism has its place, though a more limited one, in applied research even today when we have so much better foundation of theory to guide us.

Edison's versatility was as amazing as his boundless energy. His curiosity and imagination led him into many fields, one of which was telephony. His contributions to that art were many. He was the first to use carbon contacts in a telephone transmitter. He invented a telephone repeater and a circuit in which to use it. The "Edison effect" which he discovered was basic to the amplifying vacuum tube developed later by others.

One of his most important contributions to telephony was an improvement in the granular carbon transmitter made about 10 years after telephones came into use. There is a story I have heard that representatives of the Telephone Company called on Edison to learn the details of his improved granular carbon. With some amusement he led them to his coal bin. He made it sound easy but the fact was that he had tested a tremendous variety of materials, including the then known semiconducting elements, the available rare earths, and a great variety of chemical compounds. Anthracite coal, ground up and roasted to drive off some of its gaseous content, proved to be the best. That he did a good job in this search is evidenced by the fact that today's greatly improved telephone transmitter still uses granular carbon made from anthracite coal. This story illustrates not only Edison's thoroughness and his recognition of the importance of materials, but also his delightful humor that pops up so frequently in reminiscences about him. In this character is his claim to the first use of "Hello!" as a telephone salutation, though according to his own

## Some Observations Relating to Edison

O. E. BUCKLEY  
FELLOW AIEE

IT is with great gratitude that I accept this medal which commemorates the name of one who brought light to shed on all. If some of its luster is reflected on the Bell Telephone Laboratories I can accept it the more happily, for it is to Bell Laboratories, where I served for many years, and to its members and its sponsors, that I owe all that is symbolized by the bestowal of this honor on me. I could speak at great length about the accomplishments of that organization, but I would rather take this occasion to make some observations about the man for whom the medal is named and about some of his works.

So great a reputation for miraculous achievement did Thomas A. Edison acquire that his name has become a legend. No medal or other memorial is needed to preserve his name; but we will all do well to recall his life and his achievements, for there is not a single one of us in this hall whose own life has not been profoundly affected by Edison,

O. E. Buckley, retired, was president of Bell Telephone Laboratories, Inc., New York, N. Y.



**Dr. Oliver E. Buckley, retired president, Bell Laboratories (third from left) receives the 1954 Edison Medal from AIEE President A. C. Monteith, also vice-president of Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Left to right are: J. R. Kerner, General Session chairman, Winter Meeting; O. B. Blackwell, 1950 Edison medalist; Buckley; Monteith; J. F. Fairman, chairman, Medal Award Committee; and A. J. Cooper, Meeting chairman**

statement he never carried on a conversation over the telephone until 1915 when he talked from the San Francisco Exhibition to his associates in his laboratory in Orange, N. J.

With all the advances that have been made by great industrial laboratories since Edison's day, let no one think that the day of the inventor is done or that opportunity for invention is less. Indeed, with the great flood of new knowledge uncovered by fundamental research, the opportunity for those who have inventive talent is greater than ever.

Inventive talent is a somewhat rare product of heredity and environment. It is found among those of little formal education like Edison, as well as among those who have enjoyed the best of educational opportunity. Invention calls for a restless and inquiring mind and also practical common sense together with a desire to achieve useful ends. It calls, too, for a lot of hard work and persistence and a big store of practical knowledge. The "flash of genius" comes only to the fellow who is looking for it and can recognize the need for the new thing he has conceived. Even among highly selected research workers the productive inventors are relatively few.

With all of the opportunity for invention that now exists there is reason for concern lest the most not be made of it. The miraculous has become commonplace. High school courses in science and mathematics seem not to give the inspiration they once did. Life in the midst of highly per-

fected gadgetry does not give youngsters a feeling for technology and craftsmanship at the time of life when they are most readily inspired. These circumstances have led the Thomas Alva Edison Foundation to organize a joint effort of leaders in industry and education to take remedial steps in this situation and thus to contribute to the alleviation of the shortage of technical manpower. In this connection the Edison Foundation has also prepared, and made available for educational purposes, a number of inspiring booklets and pamphlets relating to Edison's activities and to the history of technology.

Another activity of the Edison Foundation is the preservation of Edison's laboratory, his library, his correspondence, and the thousand or more notebooks in which are recorded his original technical observations. These and other relics are on view at the Edison Museum in West Orange which attracts an increasing number of visitors every year and is well worth your while to see if you have not already been there.

There is more than sentiment to be fostered in the bestowal of the Edison medal and in the preservation of the relics of his activities. There is a lesson to be learned in the factors that surrounded and influenced the development of such prolific inventors as Edison, Bell, Westinghouse, and others of their kind, lest young potential inventors in our midst, now and in time to come, fail to realize this opportunity for achievement and public service that is open to them.